many editions, and is a classic story of geographical achievement. In recognition of his services McClintock was knighted, and in 1865 was elected a Fellow of the Royal Society. He was appointed a K.C.B. in 1891.

NOTES.

IN consequence of numerous reports as to the occurrence of a very serious disease among bees in the Isle of Wight, known locally as "paralysis," the Board of Agriculture and Fisheries instructed Mr. A. D. Imms to undertake an inquiry into the nature and cause of the disease; his report on the result of his investigations has now been issued by the Board in pamphlet form. Fortunately, the geographical distribution of the disease is confined apparently to the Isle of Wight, so that with due precaution there should be little or no fear of its spreading to the mainland apiaries. "The disease is eminently one of the digestive system, and might be described as being a condition of enlargement of the hind intestine." Smears made from the contents of the colon showed large numbers of bacteria, and it is possible that there may be some connection between this disease and the well-known form of "dysentery" in bees. The symptoms are complete loss of flight, crawling aimlessly over the ground or up grass stems and the supports of the hive.

THE cablegrams from America in Monday's papers announced the tragic death of Prof. L. M. Underwood, of Columbia University, New York. His mind had been unhinged by the recent financial crisis, and he committed suicide after killing his wife and attempting to kill his daughter. He was born in New York State in 1853, and became professor of botany in Columbia University in 1896. His published works included "Descriptive Catalogue of North American Hepaticæ," "Moulds, Mildews and Mushrooms," "Our Native Ferns and their Allies," and "Our Native Ferns and How to Study Them."

AT the unanimous invitation of the executive committee of the Yorkshire Naturalists' Union, Dr. Wheelton Hind has accepted the presidency of the union for the forthcoming year. Dr. Hind is well known throughout the country for his successful work amongst Carboniferous rocks, and in Yorkshire he has been unusually successful in identifying and tracing various zones in the Carboniferous limestone. His work in Yorkshire makes the selection of him as president of the county society very appropriate, and will doubtless result in increased attention being paid to the geological problems of the Carboniferous period by the members of the union.

THE gold medal of the Institution of Mining and Metallurgy has been awarded to Sir Archibald Geikie, K.C.B., F.R.S., in recognition of his services to geological science. The Consolidated Gold Fields of South Africa gold medal and premium has been awarded to Dr. T. K. Rose for his researches on the metallurgy of gold.

THE programme of the arrangements for the new session of the Society of Arts which has just been issued includes a series of six lectures on industrial hygiene by different experts, who will deal with such subjects as dust in factories and in mines, lead and mercury poisoning in pottery and match-making, work in compressed air, and child labour. A course of lectures on the "Navigation of the Air" is to be given under the Shaw trust by Dr. Hele Shaw, F.R.S. Four courses of Cantor lectures are announced, the first on the microscope, by Mr. Conrad Beck. There is a very full list of papers for the ordinary and sectional meetings, and at Christmas Mr. Martin Duncan will lecture to a juvenile audience on the kinematograph.

DR. KOCH, who returned to Berlin early this month after an absence of eighteen months in German East Africa, has been promoted to the rank of Wirklicher Geheimer Rath, with the title of Excellency, in recognition of his researches into the causes of the sleeping sickness.

AT the meeting of the London Mathematical Society on November 14, the council and officers for the ensuing session were elected as follows:—*President*, Prof. W. Burnside; *vice-presidents*, Prof. A. R. Forsyth and Prof. H. M. Macdonald; *treasurer*, Prof. J. Larmor; *secretaries*, Prof. A. E. H. Love and Mr. J. H. Grace; *other members of the council*, Dr. H. F. Baker, Mr. A. Berry, Mr. T. J. I'A. Bromwich, Mr. A. L. Dixon, Prof. E. B. Elliott, Mr. G. H. Hardy, Dr. E. W. Hobson, Sir W. D. Niven, Mr. H. W. Richmond, and Mr. A. E. Western.

THE *Times* correspondent at Paris gives in the issue of November 14 particulars of an improvement of wireless telegraphy apparatus on board French warships which has enabled communication to be made with facility at a distance of 750 kilometres (466 miles), while the previous *maximum* distance was 300 kilometres (186 miles). According to a telegram from Algiers, the cruiser *République*, on leaving Toulon, proceeded to Ajaccio, a port chosen in order to increase the difficulties of transmission to the *Jules Ferry*, anchored at Toulon, Ajaccio being situated in a hollow of the mountains. Communication was maintained without interruption between the two ships while the *République* was *en route*. It is also stated that the *République* has been able to communicate with the Eiffel Tower in Paris from the Golfe de Jouan, in the Alpes Maritimes Department, a distance of 800 kilometres (500 miles), the ship not merely receiving messages from the tower, but communicating with it in reply.

A PROMISING career has been cut short by the death, on November 12, of Dr. A. M. Pirrie, at the early age of twenty-eight. Dr. Pirrie went to the Sudan in 1906 as anthropologist to the Wellcome Research Laboratories at the Gordon Memorial College, Khartoum. Under the direction of Dr. Balfour, the director of the laboratories, he made his first expedition up the Nile to the southern limits of the Sudan, and penetrated to remote parts of the Bahr-el-Ghazal. A second expedition took him to the borders of Abyssinia. On both occasions he was engaged on anthropological and physiological researches into tropical diseases; but unfortunately he contracted fever, and was compelled to return to England. Dr. Pirrie brought back a valuable collection of objects of anthropological and other scientific interest, and at intervals during his illness he was engaged on his report to the Carnegie Institution and the Wellcome Research Laboratories, Khartoum, for which institutions he acted jointly in the work he carried out in the Sudan.

THE sixth annual meeting of the South African Association for the Advancement of Science will be held at Grahamstown during the week ending July 11, 1908, under the presidency of the Hon. Sir Walter Hely-Hutchinson, G.C.M.G. The presidents of the sections are as follows:—Section A, mathematics, physics, astronomy, meteorology geodesy, and geography, Prof. Alexander Ogg, of Rhodes University College, Grahamstown; Sections B and C chemistry, metallurgy, mineralogy and geology, engineer

ing, mining and architecture, Prof. E. H. L. Schwarz, of Rhodes University College, Grahamstown; Section D, botany, zoology, agriculture and forestry, bacteriology, physiology, hygiene, Dr. S. Schönland; Section E, education, philology, psychology, history and archæology, Mr. W. G. Bennie; Section F, economics and statistics, sociology, anthropology and ethnology, Mr. W. Hammond Tooke. The local honorary secretary at Grahamstown is Prof. J. E. Duerden, of the Rhodes University College.

THE Paris correspondent of the *Times* states that, according to a telegram from Montpellier, a mass of earth, having a volume of about 400,000 cubic metres, and forming one whole slope, as it were, of Mont Bringuez, near Lodève, in the Department of the Hérault, has become detached and has moved over a distance of about 1200 feet, carrying with it the tilled soil, fields, woods, and meadows, and obliterating all the ordinary landmarks, bridges, roads, &c., on its passage. A large chestnut grove has thus been moved about 500 feet without, apparently, suffering any damage, but numerous lakes have been formed in the vicinity, and the spectacle is said to resemble that of a region devastated by an earthquake.

AN appeal to the charitable public on behalf of the underfed children attending elementary schools has reached us from the London County Council. For many years past various associations have rendered valuable assistance in collecting and distributing funds. With these associations the Council is in close connection, and every effort is being made to bring the Council, the associations, and the schools into such relationship as will result in a highly efficient organisation for relieving distress. In order to meet the needs of the coming winter, the Council is anxious that at least 15,000*l.* should be raised. If, however, the response is not adequate this winter, there will probably be no alternative in the winter of 1908–9 but to resort to the rates. The Council has voted a sum for equipment and appliances, and will place every convenience at the disposal of the associations. Contributions may be sent to any of the other associations cooperating with the Council, or to Mr. H. Percy Harris, chairman of the London County Council, 98 Gloucester Terrace, Hyde Park, W.; Mr. John T. Taylor, chairman of the Education Committee, 19 Woodchurch Road, Hampstead, N.W.; or Mr. E. A. H. Joy, chairman of the Subcommittee on Underfed Children, Tower House, Woolwich.

A MEETING of representatives of sanitary committees of county and borough councils and port sanitary authorities of England and Wales was held at Caxton Hall, Westminster, on November 15. The object in view was to consider the establishment of a permanent union of such authorities to secure uniformity of action in the administration of matters relating to public health. Mr. H. W. Newton, chairman of the sanitary committee of the Newcastle Corporation, who presided, moved the following resolution, which, after considerable discussion, was adopted by a large majority. The resolution approved of the establishment of a union of the sanitary authorities of England and Wales for the purpose of promoting the public-health interests of the nation. The union is to have for its immediate objects:—(1) to secure, so far as may be practicable, harmony of interest and uniformity of action among sanitary authorities in general on matters relating to the public health; (2) to stimulate and concentrate effort for the purpose of effecting necessary sanitary reforms, whether for the public weal or the benefit of individual sanitary districts; (3) to encourage and promote the study of practical hygiene, and to educate opinion with respect to the national as well as the local importance of public-health work in general; (4) to consider the different conditions and circumstances, general or local, whereby disease is liable to be caused to man, and, so far as may be, to obtain their removal. Other resolutions were also adopted empowering the chairman and Dr. H. E. Armstrong, of Newcastle, as a provisional committee, to draw up a constitution to be discussed afterwards, and to communicate with sanitary authorities asking their adhesion to the union under the name of "National Union of Public Health Authorities."

THE October issue of the *Museums Journal* is illustrated with a portrait of the late Mr. John Maclauchlan, president of the Museums Association, 1906–7. Mr. Maclauchlan presided at the July meeting of the association in Dundee, when he appeared to be in excellent health, but in September he was prostrated by the acute development of a mortal disease with which he had been afflicted for some time, and on October 1 the attack had a fatal termination.

IN the August number of the *Philippine Journal of Science* (ii., No. 4), Lieut. Clarence Cole records the frequent occurrence of the parasitic worm *Necator americanus* in natives of the Philippine Islands; Mr. Harry Marshall gives a good summary of the trend of recent research in immunity; and Dr. Musgrave and Mr. Richmond discuss the relation of infant feeding and infant mortality in the Philippines.

WE have received No. 8 of vol. i. of the Bulletin of the Committee for the Study of Special Diseases, Cambridge. It contains an inquiry into the value of the opsonic index by Messrs. FitzGerald, Whiteman, and Strangeways. As the result of an enormous amount of work, the conclusion is arrived at that, unless at least 1000 cells are counted, the percentage error may be so great as to render the method worthless. In view of the concordant experience of a number of different observers on the value of the method, this conclusion cannot be accepted as final, though it is difficult to detect any fallacy in the experimental details.

TO the sixth number of *British Birds* Mr. H. S. Gladstone communicates some interesting particulars with regard to the Irish nesting-colony of red-necked phalaropes, the one place in the United Kingdom where the species is known to breed. Although not reported until 1903, it appears that a few pairs of the birds had established themselves three years previously. In 1902 seventeen birds, mostly females, were seen; two years later Mr. Gladstone estimated the number at thirty pairs, while in 1905, when the nesting-area had become considerably enlarged, he considered there were nearly fifty couples. Unfortunately, the original tenant, who did all he could to protect the birds, has left the farm, and there are ugly reports of a big egging-raid having taken place during the past season.

A REMARKABLE new dipterid larva, *Acanthomera tetratruncum*, from Paraguay, is described by Mr. Karl Fiebrig in the *Zeitschrift für wissenschaftliche Insectenbiologie*, ser. 2, vol. ii., pp. 316–323 and 344–347. The larva, it appears, is a wood-borer, and has the mouth-parts modified into a powerful boring organ. The terminal segment of the body forms an extremely hard, chitinous shield, beneath which is a "mouth-like" chamber for the reception of the posterior stigmata, these being thereby completely protected from contact with foreign bodies. There is, moreover, a finger-shaped tracheal organ in this region which may act as a kind of "gill-stigma." The adapta-

tion of the larva to its peculiar mode of existence is thus very marked. The larval stage seems to be unusually prolonged, an apparently almost full-grown larva observed at the end of July not having developed into the imago until the following January. As it was observed to be still active a short time before the final transformation the pupa-stage is inferred to be brief. An enlarged figure of the adult fly is given in the second part of the paper.

Two papers in the October number of the *Journal of Anatomy and Physiology* relating to Australian natives are of more than ordinary interest. In the first, Dr. W. L. H. Duckworth describes several brains, pointing out that these afford evidence of the low grade of the aborigines. They frequently show, for example, features very rarely met with in the white races, which are, however, normal in apes. Such simian features are, nevertheless, by no means restricted to Australians, whose brains are in other respects essentially human. In the second paper Dr. Ramsay Smith, after describing the results of an investigation into the mode of development of the teeth of Australians, discusses the bearing of this on tooth-development generally. He finds that simple cuspidate teeth, like canines and incisors, are developed from a single tube of dentine, tipped or capped with enamel, and also that this development takes place by constriction. This being so, he urges that in the case of complex teeth, such as molars, in place of any fusion or absorption of cusps, development has taken place by plication or constriction of an original primitive, single, simple tube, according to the method revealed by his observations. Hence the theory of the origin of "heterodont" teeth from fused primitive cones, as well as the theory of the aggregation of cusps, so far at least as it involves the origin of roots, must be re-considered.

On the subject of school gardens, attention is directed in the editorial of *Irish Gardening* to the absence of these in Ireland, although it is an essentially agricultural country, while in most European countries they have been extensively provided. Mr. W. Johnston contributes a practical article on raspberry cultivation, and Mr. P. Brock writes on the propagation of chrysanthemums; special articles are also concerned with the development and classes of carnations, and the culture of Cape heaths.

Miss A. G. Stokey has contributed to the July number of the *Botanical Gazette* a description of the roots of *Lycopodium pithyoides*, a subtropical plant in which every stem is a potential sporophyll. The stem is characterised by the large number of roots that run through the cortex, amounting to more than fifty in one instance. The roots arise within a few millimetres of the apex of apparently mature stems. The vascular strand in the root shows in transverse section a crescent-shaped mass of xylem, with phlœm lying between the horns of the crescent. At the apex of the root four distinct initial regions can be distinguished.

With the object of disseminating the information locally and for others interested, Dr. W. L. Bray has prepared an account, published as Bulletin No. 82 of the University of Texas, of the distribution and adaptation of the vegetation in that State. The factors that control the various plant zones are discussed upon the principles laid down in Schimper's "Pflanzen-Geographie." In connection with water supply, the author distinguishes primarily a moisture-demanding vegetation in east Texas and a dry-climate vegetation in west Texas. Mesophytic types of woodland, notably long- and short-leaf pine and mixed forests, are characteristic of the east, whereas in the west, xerophytic formations abound, such as the "chaparal" scrub, grassy plains, and the "sotol" country inhabited by succulents and dwarf shrubs. There is also a wide range of temperature, from the semi-tropical region where the culture of tropical plants is only prevented by occasional forests, to a cold zone where the Douglas spruce is dominant. Between these lie the "cotton-belt" and the "corn-belt."

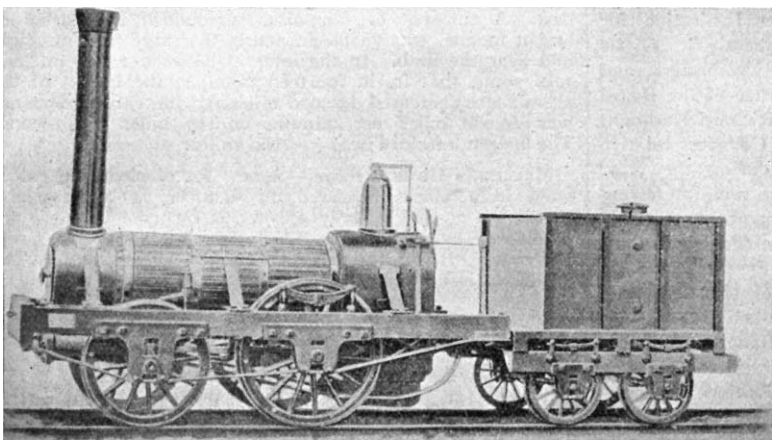
In the September number of the Cape of Good Hope *Agricultural Journal*, Mr. Robertson describes his investigations on a local cattle disease he considers to be identical with Nocard and Leclinche's "pasteurellose." He isolated from the affected tissues a bacillus which produces all the symptoms of the disease when inoculated into healthy sheep or cattle. Dr. Nobbs also gives an account of the work proposed to be done at the experiment stations at Knysna, on the wet "sour veld," and at Robertson, in the semi-arid "Karroo" district. These two widely different types of country are fairly common in Cape Colony. "Sour veld" is known by its vegetation; much of it is, or was, forest, but a good deal is covered with scrubby bushes 2 feet to 10 feet high, and reeds, sedges, bracken, and the sugar-bush family (Proteaceæ) are numerous. There is abundant rainfall. The land is being brought into cultivation, but is found to be very sterile in spite of being virgin soil of excellent mechanical condition. Cropping, manuring, and tillage experiments are in progress. On the fertile "Karroo" land the conditions are altogether different; the rainfall is only 10 inches or 12 inches, and as this comes chiefly in winter, recourse must be had to irrigation and special cultivation methods during summer. The experiments at Robertson are in these directions.

The Bulletin of the American Geographical Society, Nos. 7, 8, contains a paper by Miss E. C. Semple on geographical boundaries. After dwelling on the indefinite character of most natural boundaries, Miss Semple gives an account of the conditions generally existing in the border zone between two races or states, illustrations being afforded by the early history of the United States and the wide frontier between Russia and the East. The system of maintaining a waste boundary strip for protective purposes has been superseded in modern States by a fixed political boundary, which, however, does not prevent the existence of a frontier district, the inhabitants of which are generally a mixed race of the two contiguous elements. By means of a map showing the races of Central Europe, the migrations of Slav and Teuton over the political boundary are strikingly illustrated. Attention is also directed to the tendency of border zones to become inhabited by undesirable refugees from both sides.

In compliance with a request made by the Solar Commission of the Meteorological Congress at Innsbruck in 1905, the Weather Bureau of the Philippines has published a useful statement of the rainfall of that archipelago, in the preparation of which all the available data at the disposal of the Manila Observatory have been revised by the Rev. M. S. Masó, S.J., under the direction of the Rev. Father Algué. The rainfall differs considerably, owing to the extension of the archipelago in the N.–S. direction; the annual average amount is about 87 inches, the extreme values being 35·5 inches and about 157 inches. Three different climates are distinguished; the first and worst has two well-defined seasons, wet and dry, in which more than 80 per cent. of the annual fall

occurs during the summer months. The second climate consists of eight or nine rainy months, the percentage being high in both summer and winter. The third and best climate has a fairly even distribution of rainfall over the whole year. Reference should be made to the paper in question for particulars as to the location of these districts; tables are given showing the monthly and annual rainfall at all stations.

THE Journal of the Franklin Institute (vol. clxiv., No. 4) contains an interesting report on the development of the American locomotive as exemplified in the Baldwin Locomotive Works of Philadelphia. Founded in 1831, the works in 1832 completed one locomotive and employed thirty men. In 1906 they built 2652 locomotives and employed 17,432 men. Illustrations are given of seventeen locomotives of different types made by the company, the most interesting being the famous "Old Ironsides," completed and tried on November 23, 1832. In these early days mechanics were few, and suitable tools could hardly be obtained. Cylinders had to be bored with a chisel fastened in a block of wood, whilst blacksmiths who could weld bars of iron exceeding 1¼-inch square were not to be had. Mathias Baldwin, therefore, had to do most of the work himself in order to educate the men who assisted him to fashion the necessary tools for the various processes.



"Old Ironsides" Locomotive.

IN view of the large number of ancient coins and medals that have been preserved, it is surprising that so little is known regarding the dies used. Some important contributions to the knowledge of the subject are made by Prof. C. Zenghelis in the *Chemiker Zeitung* of November 9. In 1904 a die used for coinage was found by a native at Tel El Athrib, Egypt, and was subsequently presented to the museum at Athens. It dates from 430 B.C. to 322 B.C., and is probably the only genuine antique die preserved. It consists of bronze, and is 6 cm. high and weighs 164·12 grams. On the base is engraved the owl exhibited by the Athenian tetradrachma pieces. The surface was covered partly with a patina of copper carbonate and partly with red cuprous oxide. On analysis it was found that the die consisted of a bronze with 22·51 per cent. of tin and 69·85 per cent. of copper. The remaining 7·64 per cent. undoubtedly consisted of oxygen, as careful tests failed to show the presence of other elements. Some cuprous oxide was mixed with the material for analysis, and as in such alloys the tin oxidises more rapidly than the copper, it may safely be assumed that the mean composition of the alloy was 75 per cent. of copper and 25 per cent. of tin. The strikingly large proportion of tin in the alloy is quite unusual for bronzes of that period, which usually contain 90 per cent. of copper and 10 per cent. of tin, and the oldest bronzes of all are still poorer in tin. The die affords remarkable evidence of the metallurgical skill of the ancients. The extreme hardness required for a die was secured by increasing the proportion of tin, whilst the requisite malleability was secured by carefully using in the preparation of the alloy the purest copper and tin, absolutely free from lead or zinc, which would have made it softer, and from antimony and arsenic, which would have made it brittle.

MADAME CURIE announces in the October number of *Le Radium* the result of her re-determination of the atomic weight of radium under conditions much more favourable to accuracy than those which existed in 1902, when she had only 9 centigrams of chloride of radium on which to work. The present determination has been made with 4 decigrams by the method used in the former case, and gives as the result 226·2, if the atomic weight of silver be taken as 107·8. Madame Curie estimates the possible error of the determination as less than half a unit.

THE Munich *Medizinische Wochenschrift* for October 15 contains a description of an induction coil for Röntgen-ray work, constructed by Dr. J. Rosenthal, which is capable of producing a photograph of a man's thorax in two seconds with the tube 50 centimetres away. This certainly brings us nearer to the much desired Röntgen-ray kinematograph of the action of important organs like the heart, and it is to be hoped that Dr. Rosenthal will succeed in still further reducing the time of exposure. One feature of his coil is the division of both primary and secondary into two or more parts, which can be placed in series or in parallel with each other without stopping the coil.

THE August Bulletin of the Bureau of Standards of Washington contains an article on the melting points of the elements of the iron group by Mr. G. H. Burgess. The determinations were made by placing minute quantities (0·001 milligram) of the elements on a platinum strip heated by the passage of an electric current through it. The temperature of the strip was measured by an optical pyrometer standardised by reference to the melting points of zinc, 419° C.; antimony, 630°·5 C.; copper, 1084° C.; and platinum, 1753° C. The results are as follows:—iron, 1505° C.; chromium, 1489° C.; cobalt, 1464° C.; nickel, 1435° C.; manganese, 1207° C.

THE report of the director and librarian to the Warrington Museum Committee for the year ending June 30 provides evidence that good work in the direction of encouraging scientific observation is being done at Warrington with the aid of the museum and its staff. Among other arrangements made at the museum to interest students and young pupils in natural history may be mentioned the wild-flower table, which appears to be visited regularly by students and by teachers preparing

object-lessons. With the assistance of voluntary helpers, the staff provided for the table during the year more than 2500 specimens of freshly gathered wild-flowers, the greatest number on a single day being 168, on July 23.

THE Proceedings of the council of the Institute of Chemistry from July to October of the present year show that the council has directed the attention of the Local Government Board to the desirability of making the condition of appointment of public analysts attractive to candidates with the highest qualifications, and has also urged that the tenure of offices held by men of such ability and experience should be made more secure. Approval is expressed of the action of the County Council of East Suffolk, which has lately set an example by empowering the county coroner to order an analysis by a properly qualified analyst in any case of suspected poison, not being one of alleged foul play. The council has deemed it desirable to advise fellows or associates of the institute who may be seeking appointments in India to make sure they are gazetted as officers, and recognised as such in the regulations of the department under which they are seeking appointment, so that they may not find themselves in a position inferior to that to which they have a right, both officially and socially.

THE annual report of the Smithsonian Institution for the year ending June 30, 1906, has been received. Of its 546 pages, ninety-one refer to administrative matters, and include the reports of the executive committee of the Board of Regents and the acting secretary, Mr. Richard Rathbun, together with the Acts and Resolutions of Congress relative to the Smithsonian Institution adopted during the year. The appendix is again the most extensive and interesting part of the publication. Among other important contributions to this part of the volume we notice the translations of Madame Curie's opening lecture at the Sorbonne on November 5, 1906, on modern theories of electricity and matter; Prof. Himstedt's essay on radio-activity; M. H. Radau's account of astronomy on Mont Blanc; an abstract of M. A. Lacroix's description of Vesuvius in eruption in April, 1906; M. E. Bugnion's contribution to polyembryony and the determination of sex; Herr E. Pfizenmayer's contribution to the morphology of the mammoth; M. L. Cuénot's lecture on heredity; M. A. Yermoloff's description of the bisons of the Caucasus; Dr. Jakob Huber's account of the founding of colonies by Atta Sexdens; M. Hugues Obermaier's description of Quaternary human remains in central Europe; Prof. R. Blanchard's lecture on zoology and medicine; and M. Eugène Lemaire's account of the *rôle* of chemistry in paintings. Among original contributions to the appendix are those of Mr. C. G. Abbot on recent progress in astronomical research, and Mr. C. J. Blanchard on the national reclamation of arid lands. Royal Institution discourses reprinted include those of Mr. Marconi on recent advances in wireless telegraphy, and Prof. Schuster on international science. As usual, the appendix contains a profusion of beautiful illustrations.

A THIRD impression of Dr. David Nabarro's "Laws of Health" has been published by Mr. Edward Arnold. The book provides a simply worded description of the organs of the human body, and much sensible advice as to how to ensure their health and general well-being. The author has acquainted himself with the needs of schools, and his book should be of service to teachers in the preparation of lessons on elementary hygiene.

THE third volume of the "Index of Economic Material in Documents of the States of the United States" has been received. The index is being prepared for the department of economics and sociology of the Carnegie Institution of Washington, and is being published by the institution. The present instalment is by Adelaide R. Hasse, and is concerned wholly with the documents of Vermont, and deals with the years 1789–1904. The index is confined to printed reports of administrative officers, legislative committees, and special commissions of the States, and to governors' messages. It does not refer particularly to constitutions, laws and legislative proceedings, or to court decisions.

OUR ASTRONOMICAL COLUMN.

A LARGE SOLAR PROMINENCE.—Dr. A. A. Rambaut, F.R.S., sends us particulars of a large solar prominence observed by him on Friday last, November 15, at the Radcliffe Observatory, Oxford. Using a slit tangential to the sun's limb, a prominence having the form of two smooth rounded hills was observed at 11h. 45m., and it quickly increased in height until it filled the slit. A few minutes later the whole aperture in the brass plate to which the jaws of the slit were attached on the collimator was not large enough to contain the whole of the outburst. The prominence was in position-angle 273° on the sun's disc measured in the usual way from the north point through east. A sun-spot of fair size, surrounded by masses of bright faculæ, was visible in nearly the same position-angle and near the limb. In the interval between 11h. 56m. and 12h. 10m., that is, in fourteen minutes, the height of the prominence increased 140,000 miles, so the rate of increase was 10,000 miles per minute, or 167 miles per second. The height attained was 324,600 miles.

MELLISH'S COMET, 1907*e*.—A new set of elements, calculated from places observed on October 15 and 19 and November 2, and a daily ephemeris for comet 1907*e*, are published by Herr M. Ebell in No. 4212 (p. 195, November 7) of the *Astronomische Nachrichten*. The following is an abstract from the ephemeris:—

Ephemeris 12h. (*M.T. Berlin*).

1907	α (app.) h. m.	δ (app.)	log *r*	log Δ	Brightness
Nov. 20	2 14·3	+28 8·4	0·1720	9·7179	1·66
,, 24	1 32·0	+28 33·1	0·1855	9·7865	1·14
,, 28	1 1·9	+28 19·9	0·1987	9 8541	0·78
Dec. 2	0 40·5	+27 55·1	0·2116	9·9172	0·55
,, 6	0 25·3	+27 29·7	0·2243	9·9748	0·40

At the time of unit brightness (October 15) the comet's magnitude was about 9·5.

On November 23 the comet will pass about 40′ S. of α Trianguli, and on November 28 it will be 6¾° S. of β Andromedæ, crossing the meridian at about 8.30 p.m.

MARS AS THE ABODE OF LIFE.—The *Century Magazine* for November (No. 1, vol. lxxv., p. 113) contains the first of a series of articles on the possibility of Mars being inhabitable, in which Prof. Lowell discusses, as an introduction, the possible origin and evolution of planets. He commences with a description of meteorites, and traces out the various steps of the meteoritic hypothesis, and then defines six stages through which the cooling celestial mass passes in its progress from a self-luminous sun to a cold dead body. Discussing the present aspects of the planets, he shows that these are in accord with the stages defined, and points out that the crumpling which produces landscape variations is essentially an effect of cooling The relative roughness of the surfaces of the earth, of Mars, and of the moon is then discussed, and the comparatively abnormal mountainous character of the last-named explained by its initial temperature being the temperature of the combined earth and moon masses, and therefore sufficient to produce, in the cooling of so small a mass, the huge lunar mountains with which we are familiar; the non-mountainous character of the Martian landscape is also explained. This first paper concludes with a discussion of the formation and distribution of continental and oceanic areas.